

Amendment to the claims:

1-10. (Canceled)

11. (Original) An optical filter comprising:

a substrate;

a high index layer; and,

a planarized diamond-like carbon layer, the carbon layer having a surface roughness of less than 0.05 nanometers.

12. (Original) The filter of claim 11, wherein the filter has alternating multiple layers of the high index layer and the diamond-like carbon layer.

13. (Original) The filter of claim 12, wherein the high index layer is silicon.

14. (Original) The filter of claim 13, wherein the surface roughness is approximately less than 0.01 nanometers.

15. (Currently Amended) An atomic layer controlled optical filter system, the system comprising:

a substrate;

a high index layer;

a diamond-like carbon layer;

means for monitoring layer growth;

means for monitoring intrinsic stress;

means for adjusting intrinsic stress, if necessary;

means for depositing the high index layer onto a substrate;

means for depositing the diamond-like carbon onto the high index layer;

means for monitoring indices of refraction;

means for directing an ion beam onto the carbon layer; and,

means for reducing the carbon layer until the carbon layer ~~is approximately~~
~~atomically smooth~~ has a surface roughness of less than 0.05 nanometers.

16. (Canceled)

17. (Previously Presented) A optical filter comprising alternating layers of a high index of refraction material and diamond-like carbon wherein each diamond-like carbon layer has a surface with a surface roughness of less than 0.05 nm.

18. (New) The optical filter of Claim 17 forming a narrow bandpass filter having a passband of about 12.5 GHz.

19. (New) The optical filter of Claim 18 wherein the layers of high index of refraction material comprise amorphous silicon.

20. (New) The optical filter of Claim 17 wherein the layers of high index of refraction material comprise amorphous silicon.